a few cases, why not in more? And on what grounds can an investigator allege the presence of a content, not noted in a very considerable per cent. of his introspections? Aveling nowhere describes the concept; and his treatment of it as a phenomenological content demands either its description, or proof of its unmistakable recognition by the observers as co-elemental with such factors as sensation and affection.

In many cases there seems to be evidence that the supposed concept is a product of the observer's inability at the time to analyze or even describe his mental content; the introspective descriptions are often vague and indefinite, and even self-contradictory. This appears especially in the following introspection, and those following it: "I had a distinct memory idea* of a hammer, with no image and no word, 'Goral'"—the nonsense word—"was in consciousness at the time, but did not express the hammer. They co-existed co-ordinately. The idea of hammer was localized above the stimulus word" (98-99). What can an introspector mean when he states that he has an *imageless idea* of a hammer, and adds that this imageless idea is *definitely localized in space?* It would appear that Aveling and his introspectors employ the terms 'imageless' and 'idea' in a wholly novel sense. The introspections and arguments advanced (especially 111-112) do not seem sufficient to establish the validity of the statement that images and their combinations are, of themselves, meaningless.

Again, in discussing 'conceptual overknowledge,' Aveling does not do justice to the fact that he had explicitly asked his observers to watch for particular or general reference (203). The treatment of imagery, from the point of view of its relative clearness in particular and universal meanings, is confessedly inadequate (189-190). The author apparently considers only two alternative modes of conscious representation of meaning,—more or less concrete visual or auditory imagery on the one hand, and the imageless concept, on the other (103 f); and of these two alternatives he accepts the latter. The possible significance of kinaesthetic attitudes, determining tendencies, activity consciousnesses, affective tonings, etc., is largely neglected. We must, then, conclude that additional data are needed, before the existence of the abstract, imageless concept, as postulated by Aveling, can be established.

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Conditioned Reflexes Excited by Visual Stimuli in the Dog Following Extirpation of the Occipital Lobes. Thesis for the degree of Doctor of Medicine. By N. K. TOROPOFF. From the physiological department of the Imperial Institute for Experimental Medicine. St. Petersburg, 1908.

Dr. Toropoff points out the lack of precise experimental data concerning the functions of the occipital lobes in higher vertebrates and the resulting divergence of views held by various physiologists. This state of things he is inclined to attribute largely to a fatal shortcoming common to all previously employed methods of investigation, namely, the circumstance that in all of them the sole criterion of the influence of a stimulus of any kind upon the nervous system of an animal is more or less complicated motor reaction. Thus in studies

* The terms 'idea,' 'ideopresentation,' are consistently used by Aveling in the sense of imageless contents of conceptual nature, *cf.* 97, 109, *et al.*

of the functions of the visual centers the effects of extirpation were judged from impairment of the ability of avoiding obstacles and from failure of the movements which are normally excited by the exhibition of attractive or fear producing objects: such results are difficult to observe and to interpret.

These considerations led the author to undertake a study of the effects of extirpation of the occipital lobes in dogs with the aid of the method that had been developed about six years previously in the laboratory of Professor Pavloff, it having been demonstrated by the many researches of Professor Pavloff's school that any act of perception may be brought into connection with salivary secretion.

The simple or direct reflex of salivary secretion which is normally excited by the presence of food or of dilute acid solutions in the mouth is utilized for the development in the experimental animal of a series of "conditioned" reflexes by a process of association training, as follows: any convenient mode of stimulation is selected, depending on the special needs and applied several times a day, being closely followed each time by the introduction into the mouth of a very dilute solution of hydrochloric acid; eventually the artificial stimulus alone suffices to excite the secretion of saliva.* Three, four, or five such conditioned reflexes can be readily developed in the average dog.

The conditioned reflexes are, of course, a cortical function, and their loss or persistence following the extirpation of certain areas furnishes a ready means of localization of cortical sensory centers.

Successful experiments were carried out on four animals. The special object in each case was to determine the ability of the animal to discern *form* (dark cross made of cardboard, appearing in front of a white screen), *movement* (four black feathers mounted on a rotating axle, a black shadow moving to and fro on a white screen brightly illuminated by means of a magic lantern), and sudden changes in *intensity of light* (turning on electric lights in a room previously darkened, or turning them out in a room previously brightly lighted).

Following the establishment of a salivary fistula, each animal was subjected to a course of training until the conditioned salivary reflexes in response to the proper visual stimuli were developed. To make possible in each instance a demonstration of the specificity of the defect of function resulting from the extirpation, a conditioned reflex in response to an auditory or a tactile stimulus was also developed. The operation of extirpation was then performed and on the animal's recovery the presence or absence of the conditioned reflexes was ascertained.

In *Animal A.* ("Volchok") a portion of each occipital lobe was removed bounded below by a horizontal line extending backward from the upper end of the Sylvian fissure, and in front by a vertical line erected at the middle of the lower boundary. In this, as in the other animals, the first effect of the operation was the disappearance of all conditioned reflexes; but after several days salivation in response to sound, light, and a moving shadow reappeared; only the ability to discern (indentify?) objects was permanently lost.

In *Animal B.* ("Castorka") a larger portion of each hemisphere was removed, the lower boundary being the same as in *Animal A.*, and the front boundary being a vertical line erected at the anterior

* For a description of the method in English and for a full bibliography (to 1909) see the article by Yerkes and Morgulis in the Psychological Bulletin, Vol. VI., No. 8.

end of the lower boundary. The results were similar to those observed in *Animal A.*

In *Animal C.* ("Gryzhka") a still larger mass of brain tissue was removed: the front boundary was the same as in *Animal B.*, but the lower boundary instead of being horizontal extended obliquely downward and backward at an angle of about 135° in relation to the vertical line. Again the conditioned light reflex returned as did the conditioned sound and tactile reflexes; the discernment both of form and of movement was lost. Further, an added phenomenon was observed, "the chaotic state:" a whole series of non-specific auditory and tactile stimuli—electric bell, pricking of any part of the skin surface, application of heat or cold—produced reflex salivation.

Finally, in *Animal D.* ("Sultan") the largest mass of brain tissue was removed: by an oblique cut starting from a point at about the middle of the great longitudinal fissure and extending downward and backward through the upper end of the Sylvian fissure fully one-third of each cerebral hemisphere was excised; in other words, not only the occipital lobes were removed but also portions of the parietal and temporo-sphenoidal lobes. All the conditioned reflexes, including those for auditory and tactile stimulation, were lost, with this exception: in the training prior to the operation the dog was grasped by the jaw whenever the acid solution had to be introduced into the mouth and thus a special conditioned reflex had been formed unintentionally, and this reflex was found after the operation to have been preserved, so that while no secretion of saliva resulted from stimulation with scratching, sound, or light, trickling at the fistula was observed regularly every time the animal's jaw was grasped.

Not the least interesting result in the entire series of experiments was a demonstration of the apparently unimpaired educability of *Animal D.* following the operation: Dr. Toropoff easily succeeded in developing a new and highly specific conditioned reflex to occur in response to stimulation with the odor of camphor.

A. J. ROSANOFF.

Stuttering and Lisping. By E. W. SCRIPTURE. New York, The Macmillan Co., 1912. pp. xiv., 251. Price $1.50.

This is a practical book, which has been prepared to meet the needs of physicians and teachers. Part i. discusses Stuttering (description and cause; symptoms, forms, nature; diagnosis; therapy; methods of treatment); Part ii., Lisping (general discussion; negligent, organic and neurotic lisping; cluttering); and Part iii. outlines 18 sets of Exercises. There are over a hundred illustrations, including a large number of graphic records. Dr. Scripture's experience in the speech-department of the Vanderbilt Clinic, as well as his theoretical work on phonetics, have well fitted him for the task he has here undertaken.

The Psychology of Insanity. By B. HART. Cambridge Manuals of Science and Literature. Cambridge, University Press; New York, G. P. Putnam's Sons, 1912. pp. ix., 176. Price 40c net.

After an outline of the history of insanity, through the demonological, political or social, physiological and psychological periods, and a brief characterisation of the psychological point of view, the author arranges his material under three heads: symptoms, classification, explanation. The keynote of classification is Dissociation, and